

Remarks

Amendment to the claims is supported by the specification are originally filed. No new matter has been added. The Office Action of September 25, 2002 is discussed in detail below. The Paragraph numbers refer to the Paragraph numbers of the Office Action.

Drawings

Paragraph 3 of Office Action

The drawings are objected to as failing to comply with CFR 1.84(p)(4) because reference character "37" has been used to designate both the cell connector and the connection spacer.

The specification has been amended so that page 33, line 16 refers to "the cell interconnects 35a,35b". Hence, reference character "37" only designates the connection spacer (the embodiment of the connection shown in Figure 9 passes through container 27). Reference characters 35a and 35b designate the cell interconnects. In view of the change to the specification, no changes to the drawings are necessary. Applicant respectfully requests that the objection be removed.

Paragraph 4 of Office Action

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "24" and "25" has been used to designate both the battery terminals and the negative and positive electrode, respectively (see page 36

In page 36, lines 22-23 have been amended to recite "positive and negative battery terminals 24,25". Hence, reference characters "24" and "25" only designate the

battery terminals. In view of the change to the specification, no changes need to be made to the drawings and applicant respectfully requests that the objection be removed.

Claim Rejections - 35 USC 112

Paragraph 6 of Office Action

Claim 22 is rejection under 35 USC 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections.

According to MPEP 2173.05(g):

"A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g. as evidenced by its specific structure or specific ingredients). These is nothing inherently wrong with defining some part of an invention in functional terms.

(emphasis added)

Claim 22 provides a functional cooperative relationship between the hydrophobic material and the opening of the enclosure housing. Specifically, claim 22 recites that the hydrophobic material is positioned relative to the opening so as to prevent passage of said electrolyte out of said cell. Hence, the exact structural relationship is NOT essential to claim 22. The rejection under 35 USC 112 is improper and applicant respectfully requests it be removed.

Claim Rejections - 35 USC 103**Paragraph 11**

11. Claims 1-5, 7-11, 13-20, 22-24, 26-35, 54-55 and 57-69 are rejected under 35 USC 103(a) as being unpatentable over Klein 5,478,363 in view of Sindorf 5,059,496.

Claim 1-5 have been cancelled.

Claim 7 has been amended as follows:

7. (amended) A nickel-metal hydride multi-cell battery, comprising:

a battery case; and

a plurality of nickel-metal hydride electrochemical cells housed in said battery case, each of said cells including:

at least one nickel hydroxide positive electrode, at least one hydrogen storage alloy negative electrode and an alkaline electrolyte; and

an enclosure housing said at least one positive electrode, said at least one negative electrode and said electrolyte, said enclosure including a gas permeable membrane allowing passage of cell gases into and out of said cell but preventing passage of said electrolyte out of said cell.

Claim 22, as amended recites:

22. (amended) A nickel-metal hydride multi-cell battery, comprising:

a battery case; and

a plurality of nickel-metal hydride electrochemical cells housed in said battery case, each of said cells including:

at least one nickel hydroxide positive electrode, at least one hydrogen storage alloy negative electrode and an alkaline electrolyte; and

an enclosure housing said at least one positive electrode, said at least one negative electrode and said electrolyte, said enclosure having an opening allowing passage of cell gases into and out of said cell; and

a hydrophobic material positioned relative to said opening so as to prevent passage of said electrolyte out of said cell.

With regards to claim 7:

Klein is directed to multi-cell batteries made by stacking wafer cells. Klein discloses that each wafer cell may be completely sealed or it may be provided with vents for release of excess pressure that may build up in the cell during charging (col 5, lines 16-18). However, Klein provides no teaching or suggestion that the vent may be formed as "a gas permeable membrane allowing passage of cell gases into and out of said cell but preventing passage of said electrolyte out of said cell", as recited by applicant in claim 7.

It is emphasized that Klein's cells are either (1) completely sealed or (2) provided with a vent (col 5, lines 16-18). Hence, if no vent is provided, then the cells are

completely sealed and gases cannot get into or out of the cell through the material of the cell.

With regards to applicant's claim 22, Klein provides no teaching or suggestion of an:

*"...enclosure having an opening allowing passage of cell gases into and out of said cell; and
a hydrophobic material positioned relative to said opening so as to prevent passage of said electrolyte out of said cell"*

as recited in applicant's claim 22.

Sindorf is directed to a nickel-hydrogen battery cell. The nickel-hydrogen battery cell uses a nickel electrode for the positive electrode and a hydrogen electrode for the negative electrode. Sindorf's electrochemical cell includes a port comprising a filter suitably made of a non-wetting porous material or a plate made of sintered polymeric material which allows gases to pass freely through the filter but will not allow liquid electrode to pass through.

Sindorf provides no teaching or suggestion of nickel-metal hydride electrochemical cells. In particular, there is no teaching or suggestion that the port/filter disclosed by Sindorf for use in a nickel-hydrogen battery may be used in a nickel-metal hydride cell (having a battery chemistry which is distinct from a nickel-hydrogen cell).

In order for references to be properly combined they must contain some teaching or suggestion of the proposed combination. As discussed, Klein provides no teaching or suggestion of gas permeable membranes. Likewise, Klein

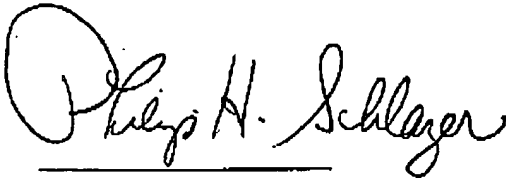
provides no teaching or suggestion of a hydrophobic material positioned relative to an opening so as to prevent passage of electrolyte out of the cell. Sindorf provides no teaching or suggestion of nickel-metal hydride batteries (a distinct battery chemistry from nickel-metal hydride). Neither reference contains any teaching or suggestion that they be combined. Hence, the combination is improper.

Claims 1-5, 14, 15, 16, 29, 30, 31, 54-69 have been cancelled. In view of the above amendments and remarks, the combination of Klein in view of Sindorf fails to teach or suggest the limitations as recited in applicant's claims 7 and 22. Claims 8-13, 17-20 depend from claim 7 and include all the limitations of claim 7 as well as additional limitations. Likewise, claims 23-28, 32-35 depend from claim 22 and include all of the limitations of claim 22. Hence, the rejected under 35 USC 103(a) as being unpatentable over Klein in view of Sindorf is overcome and applicant respectfully requests it be removed.

SUMMARY

Claims 1-5, 14, 15, 16, 29, 30, 31, 54-69 have been cancelled. In view of the above amendments and remarks, the remaining claims 7-13, 17-20, 22-28, 32-35 are in condition for allowance. Applicant respectfully requests reconsideration, removal of remaining objections and rejections, and notification of allowance. Should the Examiner have any questions or suggestions regarding the prosecution of this application, he is asked to contact applicant's representative at the telephone number listed below.

Respectfully submitted,



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MARKED UP COPY OF THE AMENDMENT TO THE SPECIFICATION

Page 33, please replace the paragraph of lines 8-18 with the following replacement paragraph:

A cell enclosure 27 accommodates the positive electrodes 4, the negative electrodes 5, the electrolyte and the separators 6 of each of the electrochemical cells. Generally, the cell enclosure 27 may be formed of any material which will not be corroded by the electrolyte. Examples of materials include, not are not limited to, plastics, ceramics and metals (such as stainless steel). If a metal is used, the metal should be electrically insulated from the cell interconnects [37] 35a,35b. Preferably, the enclosure is formed from a nonconductive material such as a nonconductive polymer or ceramic.

Page 36, line 21 to page 37, line 2, please replace the paragraph with the following replacement paragraph:

The electrochemical cells 101A,B,C are housed in a battery case 20 having positive and negative [electrode] battery terminals 24,25. The battery case 20 preferably also has a resealable vent 18. The battery case 20 was described above and that discussion is, of course, applicable to the embodiment shown in Figure 9.

MARKED-UP COPY OF THE AMENDMENT TO THE CLAIMS

7. (amended) A nickel-metal hydride multi-cell battery, comprising:

a battery case; and

a plurality of nickel-metal hydride electrochemical cells housed in said battery case, each of said cells including:

at least one nickel hydroxide positive electrode, at least one hydrogen storage alloy negative electrode and an alkaline electrolyte; and

an enclosure housing said at least one positive electrode, said at least one negative electrode and said electrolyte, said enclosure including a gas permeable membrane allowing passage of cell gases into and out of said cell but preventing passage of said electrolyte out of said cell.

9. (amended) The battery of claim 7, wherein said [polymeric] membrane comprises a hydrophobic material.

22. (amended) A nickel-metal hydride multi-cell battery, comprising:

a battery case; and

a plurality of nickel-metal hydride electrochemical cells housed in said battery case, each of said cells including:

at least one nickel hydroxide positive electrode, at least one hydrogen storage alloy negative electrode and an alkaline electrolyte; and

an enclosure housing said at least one positive electrode, said at least on one negative electrode and said electrolyte, said enclosure having an opening allowing passage of cell gases into and out of said cell; and

a hydrophobic material positioned relative to said opening so as to prevent passage of said electrolyte out of said cell.